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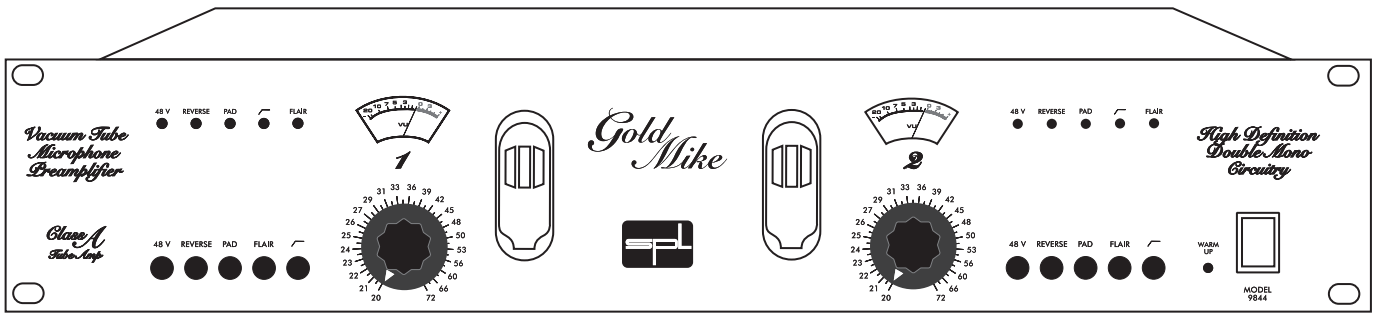
Manual



Gold Mike

Model 9844

Vacuum Tube Microphone Preamplifier

Manual

By Hermann Gier and Wolfgang Aichholz

Version 1.4 - 5/2000

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Contents

Foreword 3
Introduction 4
Hookup 5
Installation & Connections 5
Power Supply 6

Tech Talk 7

Control elements 9
- MIC GAIN 9
- 48 V 9
- REVERSE 10
- PAD 10
- HIGHPASS 11
- FLAIR 11
- Displays 11

Specifications 12
Warranty 13

Foreword

Dear customer,

Thank you for the confidence you have shown towards SPL electronics GmbH by purchasing the SPL GoldMike. You have decided to use an innovative microphone preamp which provides excellent sound quality by combining exemplary specifications with highest manufacturing standards. Please read this manual carefully to ensure you have all the information you need to use the Gold Mike. We wish you every success with it.

Your Sound Performance Lab-Team

Thanks

I would like to start with my thanks to all our staff, who created what is to be described here. The importance of their exceptional qualification and talents cannot be overestimated. Special thanks to Ruben Tilgner for his creativity.

Our products are often tested and compared in many publications and by our customers themselfs and constantly valued with best results. I would like to pass on this broad appreciation to those, who deserve it – my excellent colleagues.

Hermann Gier

Introduction

The GoldMike is another jewel in the SPL Tube series. Like all SPL tube processors, the GoldMike combines the unique sonic qualities of tube technology with state-of-the-art manufacturing, meticulous component selection and high-tech conception.
This latest product, a dual-channel tube microphone preamplifier with superb sonic qualities, is particularly suited for recording vocals and acoustic instruments. You will be surprised by not only its precision but also the natural impact of different vocal timbres – the silky warmth of a pristine tube sound is needed by more than just acoustic guitars!
You don't have to listen to those dead and sterile HD recordings. GoldMike's whisper quiet performance makes it ideal for digital recording. Even the most demanding recording subjects, such as a choir, are easily handled. The Class A tube amp, designed as two independent mono blocks, guarantees absolute channel separation. Your stereo recordings in particular will benefit from a wider stereo depth.
GoldMike's technical standards are predicated on an uncompromising effort to combine the sonic advantages of tubes with the experience of more than 12 years of research in semi-conductor amplification design.
The GoldMike allows for up to 72 dB of gain – a value tube-only designed preamps can't match. The SPL tube/IC construction, on the other hand, superbly combines today's standards with such trademark tube characteristics: improved spatial depth, rich detailed imaging, warm and smooth sonics. Moreover, the GoldMike delivers high common-mode-rejection and ultra linear amplification in addition to the high gain capabilities.

Features

- Unique "FLAIR" circuitry enhances the presence and intelligibility of any signal. Vocals, for example, seem to move closer. Pristine, non-colored "softening" of very harsh and aggressive sounds
- 50 Hz high-pass filter
- Phase reverse switch
- 30 dB pad
- Switchable 48-volt phantom power with independently filtered power supply
- High-quality ALPS potentiometers
- Click-free switches
- Five LEDs per channel
- Two backlit VU meters
- Warm-up LED indicates tube status during warm up
- Star ground wiring scheme for best sound performance; extra wide PCB ground connections guarantee stable voltage distribution
- Power supply with state-of-the-art filtering schemes and solid power reserves (6000 µF in the main supply and 400 µF in the tube supply)
- XLR inputs
- XLR and 1/4" outputs (can be used individually or simultaneously)

Carefully select a place for setting up the GoldMike. The unit should be situated away from heat sources and direct sunlight. Avoid installing your GoldMike in environments exposed to vibrations, dust, heat, cold or moisture. Keep the unit away from transformers or motors or any other unit that could generate large variations in power supply or cause electrical interferences. Do not install the unit in close proximity to power amplifiers or digital processors. You may consider placing it in a rack containing other analog gear. Such placement can prevent interference from Word Clock, Smpte, MIDI, etc.

Important safety instructions--
please read carefully!

- Do not open the case. You may risk electric shock and may damage your equipment.
- Leave repairs and maintenance to a qualified service technician. Should foreign objects fall inside the case, contact your authorised dealer or support person.
- To avoid electric shock or fire hazards do not expose your unit to rain or dampness.
- In case of lightning unplug the unit. Please unplug the cable by pulling on the plug only; never pull on the cable.
- Never force a switch or knob.
- To clean the case use a lint-free cloth. Avoid cleaning agents as they may damage the chassis. Manufactured in standard 19" EIA format, it utilises two rack units.
- Please support the back of the unit whenever it is being mounted into a 19" rack (especially important when touring).

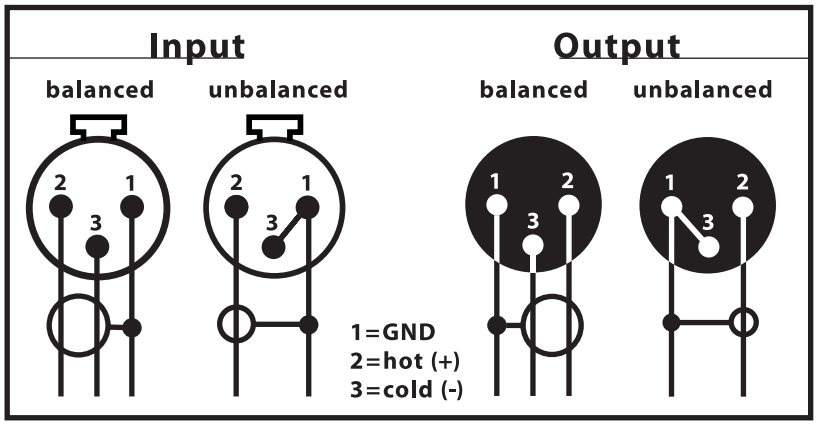
Installation & Connections

Again, while GoldMike's housing is EMV-proof and protects against HF-interference, placement of the unit is very important since it is capable of amplifying microphone signals as well as other unwanted signals up to 2200 times. Before connecting the GoldMike, or any other equipment, turn off all power. Adjust the voltage setting on the back so that it corresponds with the power conditions. The GoldMike's XLR inputs, which are used for connecting microphone and line level signals, are electronically balanced, while the outputs allow for simultaneous feed to the balanced XLR connectors as well as to the unbalanced 1/4" outputs. The unit can even be used as a microphone splitter.

The following graph shows the correct wiring for connecting unbalanced signals to the balanced XLR connectors.

VERY IMPORTANT

Phantom power must be switched off before unbalanced signals are connected! Otherwise short circuits cause damages!



Power Supply

A stable, low ripple torroidal power supply is the foundation for any high-fidelity sound shaping.

The GND-LIFT switch helps eliminate hums caused by ground loops.

Phantom Power with a complex filtering scheme and highly selected components.

Built around a torroidal transformer, the power supply allows for a minimal electromagnetic field with no hum or mechanical noise.

The supply voltage can be set to 230 V/50 Hz or 115 V/60 Hz. Check your country's power requirements for the appropriate setting. An AC power cord is included to feed the IEC-spec, 3-prong connector. Transformer, AC cord and IEC-receptacle are VDE, UL and CSA approved. The main fuses are rated at 315mA (230 V) and 500 mA (115 V).

Chassis ground and AC ground can be physically disconnected by the “Ground Lift” switch (GND LIFT). This helps to eliminate hums. The power supply's output side is filtered by an RC circuit to extract noise and hums caused by your power service. 6000µf capacitors smooth out the positive and negative half waves.

The phantom power is derived from a separate winding in the transformer. Filtered and rectified by a series of zener diodes and transistors, a clean 48 volts leaves the circuitry. This supply voltage reaches the phantom power switch through the PCB where another RC circuit stabilises the supply again. Our high quality 0.1% / 6,81 kOhm resistors ensure the pristine quality of the phantom power supply.

Advantages of the SPL dual-stage preamplifier

The GoldMike's engine is the newly designed SPL dual-stage preamplifier. During the first stage of amplification the signal is amplified by a semi-conductor circuit while the second stage applies tube electronics. We achieve a high common-mode-rejection by using laser trimmed components. Likewise, minimal noise and distortion figures distinguish our high-quality preamp. Analog Device's semi-conductor (SSM2017) is very unreceptive to HF and hum interference, and is perfectly integrated by the PCB layout; wide PCB conductors guarantee a stable power supply even when extreme level changes demand an immediate current supply. The star ground wiring scheme ensures a quiet electronic performance. The dimensions of the PCB conductors, and their respective layout (wide or narrow), were especially designed for the integration of tubes and ICs in the preamplification circuitry. The MIC GAIN potentiometer adjusts the semi-conductor stage, allowing amplification up to 2200 times the original signal. The following secondary tube stage adds a constant 6 dB of gain; therefore, the same amount of tube character is added regardless of amplification. The MIC GAIN should be adjusted for a "0" VU meter reading. At this level the best signal-to-noise performance is achieved and the tube will perform in its ideal sonic range. (Please note that the VU readings are not peak PPM but average levels. In other words, watch out for the meter hitting the red.)

The GoldMike combines superb signal-to-noise specs with not only the amplification power of semi-conductors but also the warmth and liveliness of tubes.

In summary, our dual-stage design maximises the amplification power and signal-to-noise performance of the SPL semi-conductor at the first stage and then maximises the warmth and liveliness of a meticulously selected and tested ECC 83 tube at the second stage. This makes the GoldMike an ideal partner for high-end HD recording. The unit's dynamic range of 111 dBu even outperforms some 24-bit recording gear.

An outstanding dynamic range of 111 dBu outperforms even the average 24-bit recording system.

Advantages of the dual mono design

GoldMike's two mono amplifier blocks are designed with a central power supply that utilises a star ground wiring scheme. Chief advantages of this particular layout are the excellent channel separation and, respectively, the low crosstalk figures.

Dual-Mono-Layout, with central power supply and star grounding, delivers excellent channel separation

In your daily work you will find many practical applications for these advantages. You may use the GoldMike's channels for a snare and a vocal (arguably the most important elements in a mix) simultaneously. Stereo recordings, benefiting in particular from the low crosstalk figures, will have wider stereo depth and precise spatial definition. Another advantage of the central power supply with a star ground wiring scheme is that the two individual circuitries, operating discretely, can deliver identical sonic performances per channel. The current demands of one channel (i.e., snare) are not compromised by the current demands of the other channel (i.e., vocal). All power supplying conductors, layed out identically and symmetrically, provide both channels with the necessary current.

• two discrete signals (snare, vocal) may be recorded simultaneously without crosstalk

• precise spatial definition

• identical sonic performance per channel

Sound optimization already during recording: FLAIR circuitry

The FLAIR circuitry enhances the presence of vocals and acoustic instruments, FLAIR makes these elements cut better through a mix. It has proved to be superior in double-blind tests. Once a signal completes the semi-conductor amplification stage, it is then split and fed into the tube stage and the FLAIR electronics.

The FLAIR circuitry enhances a signal's presence and cutting ability.

The FLAIR circuit is built from a unique valve/inductor/capacitor hybrid. It operates in a bandpassed frequency range from 1.5 kHz to 20 kHz. The center frequency is set at 6 kHz with a boost of 2.5 dB. Frequency response, harmonic contents and time of impact are manipulated as well. The FLAIR circuit's output is mixed directly in the tube with the source signal. The circuit's character can be best described as a "closed shelving bandpass"; nevertheless, a shifted timebase (phase) is responsible for boosting the harmonic content. The close correlation, however, between frequency- and amplitude-timebase to the dynamics of the input signal remains intact.

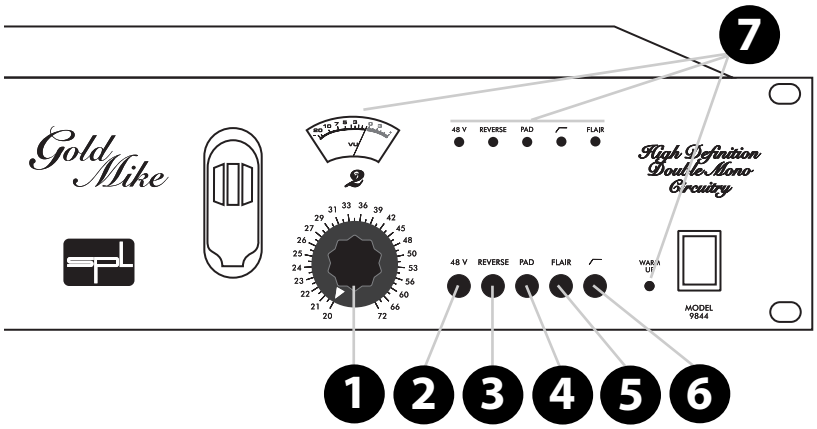
The correlation between frequency- and amplitude-timebase to the dynamics of the input signal remains intact.

Ideally suited for HD recording.

When working on a hard disc recording system, you will greatly appreciate the appeal of the Flair circuitry and the topnotch sounding signal it delivers. It can spare you hours of twiddling with a compromised recording.

WARM UP circuit

The WARM UP circuit measures the tube's anode plate and heater voltages. After approximately eight seconds the anode voltage of 250 Volts is reached; the heater voltage takes only four seconds. Once the ideal working status is achieved, the output signal is enabled. As the WARM UP LED is lit, no output is present.



1 MIC GAIN

The MIC GAIN knob controls the input signal's amplification. The range extends to 72 dB of gain. The levels should be adjusted for a meter reading around 0 VU to get the best signal-to-noise performance. Please note that the meters show only an rms/average level, so keep your GoldMike from pegging the meters' needles. When adjusting the MIC GAIN, consider the type of microphone (dynamic, condenser or ribbon) and the microphone's sensitivity; likewise, check sound pressure levels at the sound source, the microphone placement and room acoustics. The sensitivity of a dynamic microphone is approximately 2 mV/Pa, whereas a condenser microphone may reach 20 mV/Pa, an increase of 20 dB.

The VU meters show a rms/average signal

Check the transducer type and sensitivity

2 48 V

Condenser Mics require a 48-volt power supply, which is sent through the balanced audio cable on pins 2 and 3. When turning on the supply voltage, a phantom circuit is generated by splitting the 48-volt supply signal equally between the + and - conductors of the audio cabling; the voltage is returned through the cable's shield. No potential difference is present between the two conductors (+/-); dynamic microphones may be used while phantom power is switched on without damage.

Phantom power in effect reduces the interference from ground loops as well as other unwanted signals picked up by the shielding. It also proves to be a very HF resilient connection.

Phantom power specs in accordance with DIN 45 596/ IEC 268-15

WARNING: All balanced microphones with isolated grounds, even tube-equipped microphones, may be used while phantom power is switched on. All other microphones require the phantom power to be switched off.

Connect line-level signals and unbalanced microphones only while phantom power is off.

REVERSE 3

By pressing the REVERSE button, you invert the microphone's polarity. When the REVERSE button is released (status LED off) the signal is in phase. Pressing it switches the signal out-of-phase (LED on).

Tips on how to use the phase reverse

Reasons for reversing the phase:

1. You are recording a vocal or voice-over and the vocalist cannot hear him or herself very well in the headphones. Reversing the phase effectively reverses the polarity between microphone and monitor signal, thus enabling the vocalist to hear him or herself better without any volume increase in the headphones.

2. The REVERSE button is engaged to adjust the GoldMike to the polarity of a microphone or microphone wiring scheme. GoldMike's XLR connectors are configured as follows: pin 2 = high (+), pin 3 = low (-).

3. Experimenting with the phase reverse option may reward you with better results.

PAD 4

The PAD switch attenuates the input signal by 30 dB, allowing even high-level signals to be processed by the GoldMike. This may apply to loud drum or brass recordings.

30 dB pad

HIGHPASS 5

The HIGHPASS filter will pass only frequencies above a certain threshold, thereby eliminating unwanted portions of a signal. The GoldMike's roll-off point is set to 50 Hz. We use a 2nd order Butterworth filter for its low ripple. The roll-off slope is 12 dB per octave.

Filters problematic frequencies (rumble, etc.)

Applications for the HIGHPASS filter:

1. Voice-over recordings suffering from the "proximity effect", a boost in low frequencies due to the short distance between sound source and microphone.

2. "Pop" sounds that extend into the lower frequency range.

3. Any unwanted signal, such as steps, rumble and other low-frequency sounds.

6 FLAIR

Circuitry enhances presence and boosts cut-through

Manipulates frequency range, time impact and harmonic content simultaneously

True to SPL's philosophy, the GoldMike features the sound enhancing FLAIR circuitry. More than simply a frequency-range manipulating tool, the FLAIR circuitry is also a timebase shifting (phase) device that enhances a sound's harmonic content. The close relation between frequency- and amplitude-timebase and the source signal's dynamics remains intact.

FLAIR boosts the frequency range from 1.5 kHz to 20 kHz. The center frequency, set at 6 kHz, is boosted 2.5 dB and applied mainly to the harmonic content and format frequencies of voices and acoustic instruments. And finally, the FLAIR's output is mixed right along with the original source signal by the tube during the tube amplification stage.

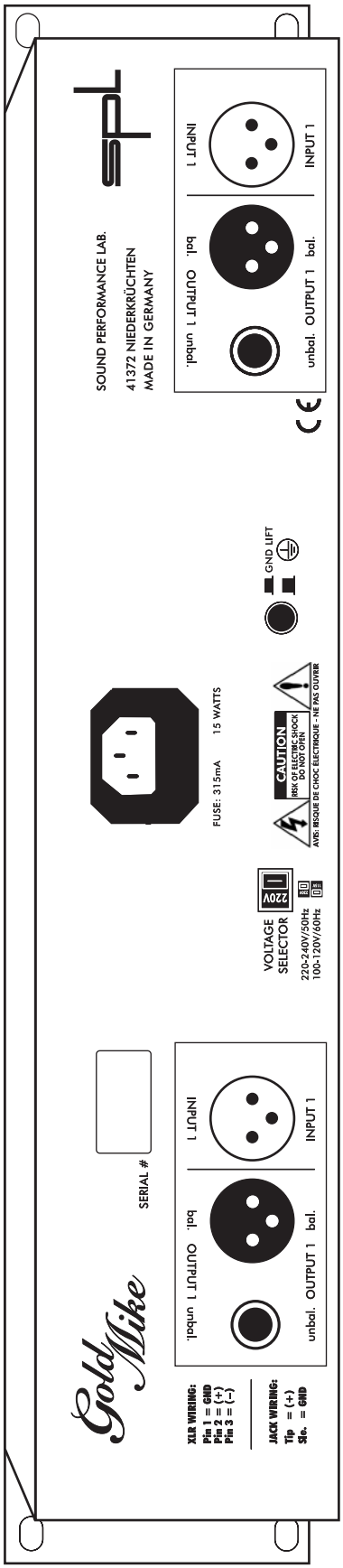
The resulting recorded signal resounds with more detail, intelligibility, presence and cut- through. The FLAIR circuitry is especially valuable when working in an HD recording environment because of the great sounding signal it delivers at the outset, thereby sparing you hours of fixing a compromised recording.

7 DISPLAYS

Each of the GoldMike's channels is equipped with a backlit VU meter (calibrated to 0 dBu) that displays the unit's output level. Five LEDs per channel display the current operating status.

The WARM UP LED, located next to the power switch, remains lit until the unit's tubes reach their optimum operating condition. As long as the WARM UP LED is lit, no output is available.

Specifications



GoldMike Rear Panel, Model 9844

Audio

Frequency Response: ..... 10 Hz - 100 kHz, +/- 0.5 dB

Common-Mode-Rejection at -20 dBu: ..... 1 kHz: -80 dBu
... 10 kHz: -73 dBu

Harmonic Distortion

Input level	Gain	THD
-30 dB	30 dB	0.175 %
-60 dB	60 dB	0.2 %

Signal-To-Noise Ratio

Signal-to -Noise ratio:	Gain	A-weighted
	72 dBu	-62.4 dBu
	60 dBu	-71.8 dBu
	30 dBu	-85.6 dBu

Dynamic Range: ..... 111 dBu

Noise Figure: 3.8

E.I.N. (Equivalent Input Noise) ..... 135.4 dBu

Inputs

Microphone/Instrument Preamplifier,
electronically balanced (differential), transformerless
Input Impedance ..... 1.8 kOhm
Max. Input Level ..... +25.72 dBu

Outputs

XLR-Output: Microphone/Instrument Preamplifier,
electronically balanced (differential), transformerless

Nominal Output Level XLR ..... +6 dB

Max. Output Level XLR ..... +25.4 dB

Nominal Output Level 1/4" ..... 0 dB

Max. Output Level 1/4" ..... +19.4 dB

Output Impedance (XLR/Klinke) ..... < 600 Ohm

Dimensions

Standard EIA 19"/1HE chassis ..... 19" x 3.47" x 6.18"
(482 x 88 x 157mm)
Weight ..... 6.7 lbs. (3.05 kg)

Rear Panel Controls and Connectors

- Balanced Inputs and Outputs (XLR/+6 dB)
- Unbalanced Outputs (1/4" / 0 dB)
- Voltage Selector 115 V/60 Hz or 220 V/50
- 3-Prong Standard-IEC-AC Receptacle
- GND-LIFT-Switch

SPL electronics GmbH (hereafter called SPL) products are warranted only in the country where purchased, through the authorized SPL distributor in that country, against defects in material or workmanship. The specific period of this limited warranty shall be that which is described to the original retail purchaser by the authorized SPL dealer or distributor at the time of purchase.

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1) arising out of materials or workmanship not provided or furnished by SPL, or

2) resulting from abnormal use of the product or use in violation of instructions, or

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4) in products with removed or defaced serial numbers, or

5) in components or parts or products expressly warranted by another manufacturer.

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